REMARKS

This is in response to the Office Action dated March 15, 2004. New claims 17-18 have been added. Thus, claims 1-18 are now pending.

Drawing and Section 112 Issues

The drawings stand objected to in paragraph 1 of the Office Action. Claim 10 has been amended to remove the objected-to feature from expressly recited subject matter. As shown in Fig. 3 of the instant application for example, an optical sensor 2 has a light receiving area corresponding to at least one pixel including R (red), G (green) and B (blue) dots. Fig. 3 illustrates that the optical sensor 2 is arranged immediately above R, G and B color filters and thereby over R, G and B dots. Accordingly, light emitted from the R, G and B dots of the pixel is first collectively captured by the sensor and then from the different wavelength components thereof the R, G and B components are separately detected and measured independently as shown in Fig. 7 for example.

This change to claim 10 is also respectfully submitted to address and overcome any potential Section 112 issue raised in paragraph 2 of the Office Action.

Art Rejections

Claim 1 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Tsuzuki in view of Suzuki and Bigio. This 3-way Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires an "optical sensor <u>having a light receiving area corresponding to at least one pixel including R (red), G (green) and B (blue) dots, the optical sensor being</u>

arranged immediately above at least one color filter and thus over at least the R, G and B dots for measuring how the liquid crystal panel is emitting R, G, and B light, wherein the R, G and B light emitted by the liquid crystal panel are measured independently from one another by the at least one optical sensor; a temperature sensor and a lamp temperature circuit for determining a temperature of the light source; wherein light emission of the light source is controlled according to a measurement value obtained from the at least one optical sensor in order to correct brightness or chromaticity or both of the liquid crystal panel, and also based upon the temperature of the light source as determined by the temperature sensor and the lamp temperature circuit." As shown in Fig. 3 of the instant application for example, an optical sensor 2 has a light receiving area corresponding to at least one pixel including R (red), G (green) and B (blue) dots. Fig. 3 illustrates that the optical sensor 2 is arranged immediately above R, G and B color filters and thereby over R, G and B dots. Accordingly, light emitted from the R, G and B dots of the pixel is first collectively captured by the sensor and then from the different wavelength components thereof the R, G and B components are separately detected and measured independently as shown in Fig. 7 for example.

According to Tsuzuki, three (R, G and B) sensors are arranged so as to each correspond to one (i.e., R, G or B) dot, respectively (col. 18, lines 33-34). According to Tsuzuki, the driver voltages are varied as a function of the R, G and B channels (e.g., see Fig. 3 of Tsuzuki). In view of these characteristics of Tsuzuki (i.e., a different sensor for each colored dot), Tsuzuki is suitable for controlling a CRT. However, if Tsuzuki's

technique is applied to an LCD where correlation exists among R, G and B dots, problems of optical and electrical crosstalk will arise. Stated another way, Tsuzuki's structure is highly undesirable because Tsuzuki requires a separate sensor to be placed in front of each dot – not a given sensor covering a plurality of different colored dots as required by claim 1.

In contrast with Tsuzuki, the invention of claim 1, with consideration given to the fact that color filters in LCDs have insufficient shielding characteristics, requires a given sensor to have a light-receiving area corresponding to at least one pixel (including R, G and B dots). The sensor is arranged immediately above a color filter(s) as shown in Fig. 3 of the instant application. Thus, all light emitted from the R, G and B dots of the pixel is first collectively captured by the sensor, and then from the different wavelength components of the light captured, the R, G and B components are separately and independently measured. According to certain example embodiments of this invention, instead of driver voltages being varied independently for each of R, G and B channels, the brightness and chromaticity are controlled in a coordinated manner by controlling the lighting of the backlight. In view of the above, it is possible to control brightness and chromaticity of an LCD screen without producing significant optical or electrical crosstalk among channels (Tsuzuki cannot achieve this as explained above).

Citation to the other art cannot overcome the fundamental flaws of Tsuzuki discussed above. Thus, even the alleged combination (which would be incorrect in any event) would not meet the invention of claim 1.

Claim 10 calls for "an optical sensor having a light receiving area corresponding to at least one pixel including R (red), G (green) and B (blue) dots, the optical sensor being arranged immediately above at least one color filter and thus over at least the R, G and B dots, the sensor including first, second and third separate and distinct functions for measuring how the liquid crystal panel is emitting R (red), G (green), and B (blue) light, respectively, so that R, G and B light output from the liquid crystal panel is measured independently." Again, the cited art fails to disclose or suggest these aspects of claim 10.

Claim 12 requires "at least one sensor having a light receiving area corresponding to at least one pixel including R (red), G (green) and B (blue) dots, the optical sensor being arranged immediately above at least one color filter and thus over at least the R, G and B dots for measuring how R, G and B light is emitted from the display panel, wherein R, G and B light emitted from the display panel are measured by the at least one sensor independently from one another." Again, the cited art fails to disclose or suggest these aspects of claim 12.

Although Takuo (JP H8-313879) was not mentioned in the Office Action, it is noted that the reference is also unrelated to embodiments of this instant invention. For instance, Takuo does not disclose or mention anything about the arrangement of a sensor, and does not make clear how any possible color management is achieved. According to Takuo, a sensor may be moved for the purpose of reducing variations among m x n divided areas. However, in this structure, it is inevitable to secure a physical gap to allow movement of the sensor, and thus ambient light tends to leak through such a gap. This

makes it not practically possible to capture only light from an LCD screen. In contrast, claim 1 for example requires the sensor to be located immediately above a color filter(s) which is advantageous for the reasons set forth above, thereby rendering moot the problems of Takuo.

Conclusion

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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